IDENTIFICATION OF RELATIVELY UNDISTURBED AREAS IN THE SOUTH OKANAGAN AND SIMILKAMEEN VALLEYS, BRITISH COLUMBIA

Ken Redpath

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Abstract

The south Okanagan region of British Columbia contains habitats that are unique in Canada. These habitats are under threat from a variety of land-use pressures. This survey identifies those areas remaining in a relatively natural state. Using 1981 land-use mapping, the category "no perceived activity" was selected to identify relatively undisturbed areas. The information was updated by interpreting 1988 black and white air photos. Field checking was conducted in 1989 and 1990 to confirm the interpretation and verify boundaries. Results indicate that only about 9% of the study area is considered to be relatively undisturbed.

Résumé

Des habitats exceptionnels au Canada se trouvent dans la partie sud de la région de l'Okanagan en Colombie-Britannique. Malheureusement, ils subissent une multitude de pressions anthropiques. Le présent inventaire localise ces habitats relativement intacts, c'est-à-dire ceux qui avaient été classés en 1981 comme des endroits où aucune activité humaine avait été détectée au moyen de photographies aériennes. Ces informations ont aussi été mises à jour à l'aide de photos noirs et blancs prises en 1988. Les vérifications de la photo-interprétation ont été effectuées en 1989 et 1990. Les résultats montrent que seulement 9% de la région étudiée est constituée d'habitats relativement intacts.

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Introduction

About 90% of British Columbia is mountainous. It is the remaining 10%, particularly the lower elevations and valley bottoms, where the majority of activities are concentrated and where conflicts tend to occur. These lower elevations are the location of human settlements, and activities, as well as important wildlife habitats.

The Okanagan valley typifies the above-noted situation. It is an area of great diversity and contrasts. The south Okanagan valley contains flora and fauna that is unique and rare in Canada. These habitats are also among the most threatened in Canada due to a variety of land-use pressures.

In response to concerns about the loss of these unique habitats, representatives of the federal and provincial governments, as well as conservation agencies and universities have drafted a strategy to conserve representative areas of these unique natural features (Hlady 1990). The Canadian Wildlife Service contributed to the development of the strategy, and provided information on relatively undisturbed areas.

Environment Canada has developed an extensive data base on land use and land-use change in the Okanagan (Kerr *et al.* 1985). This land-use information was used in the present study to identify those areas remaining in a relatively natural state. The resulting information is being used to focus on areas for more detailed investigation.

The objective of this study was to identify relatively undisturbed areas using land-use analysis. This report outlines the methodology used and presents the study results.

Study Area

The study area includes the lower elevations of the south Okanagan valley and a portion of the adjacent Similkameen River valley (Figure 1). This is the area covered in an Environment Canada fruitlands study (Kerr *et al.* 1985). Some adjacent upland areas considered ecologically important but not covered by the fruitlands study were also included (Figure 1). The region is within portions of National Topographic System (NTS) 1:50 000 scale maps 82 E/3,4,5,12.

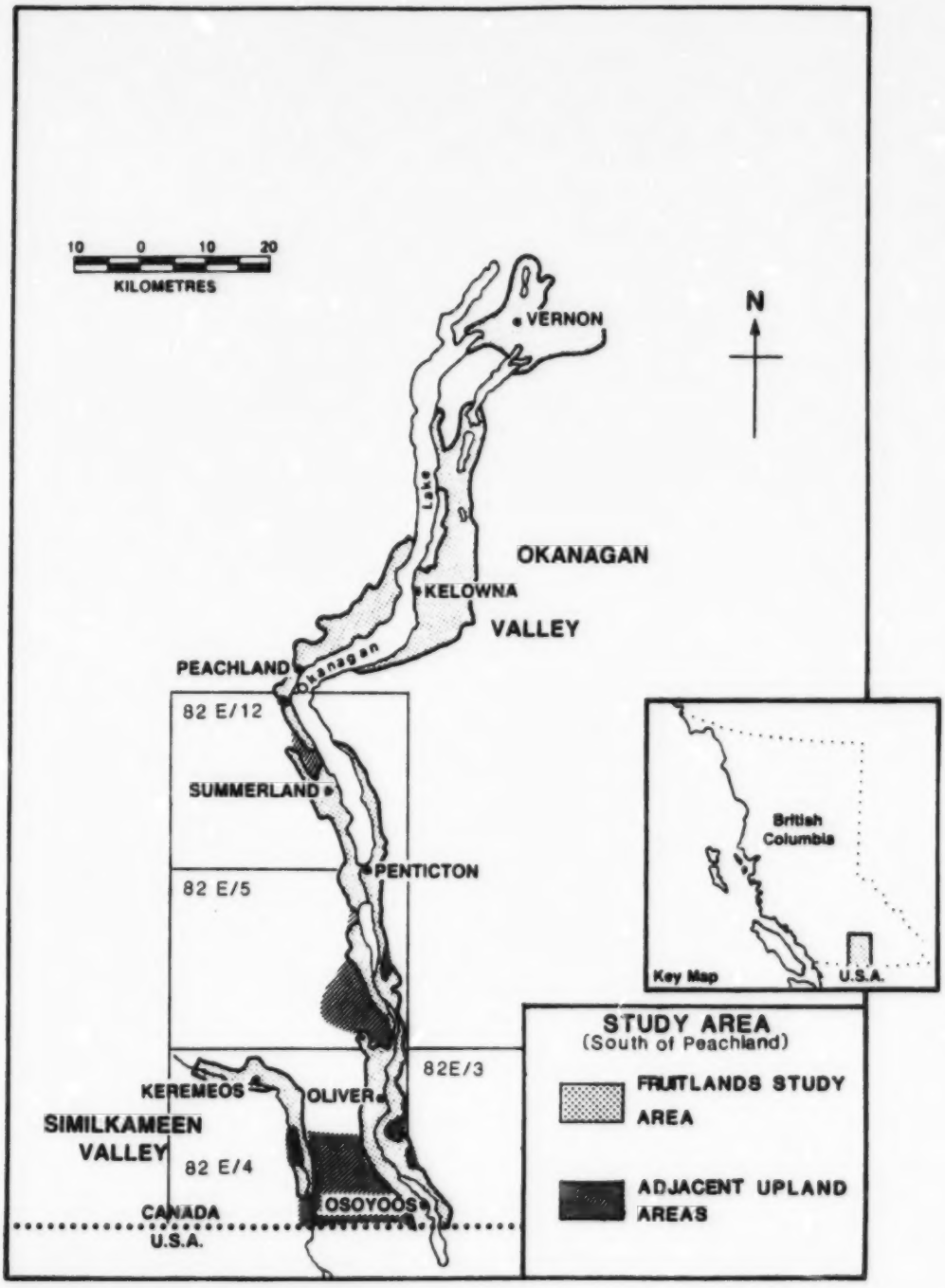
Background

As part of the Environment Canada fruitlands study, land use and land-use change was mapped at 1:50 000 scale for the years 1958, 1969, 1975 and 1981. The Canada Land Use Monitoring Program (CLUMP) classification system was used to delineate land-use units. The CLUMP land-use classification system has two elements: activity and cover. Land activity is the active use made of the land. Land cover is the vegetative, natural or artificial construction covering the land surface.

The only activity category considered in this study was "no perceived activity". The definition of "no perceived activity" (Gierman 1981) is:

> Includes all land on which there is no perceived activity taking place by whatever data source is used in mapping. Also there should be no visible evidence of former activities. This does not mean that no activity is taking place on the land but by whatever means or combination of means is used to gather the data no activity is perceived to be taking place.

FIGURE 1



(Base map adapted from Kerr et al. 1985)

Four different cover types were noted:

(1) unimproved grasslands, reeds, sedges, mosses, and other non-woody plants

(2) trees

(3) shrubs, bushes and vines

(4) bare surfaces.

Methodology

Land-use units classified as "no perceived activity" were isolated on copies of the 1981, 1:50 000 scale land-use maps. These polygons were then updated by comparing the 1981 land-use interpreted air photos and 1988 black and white air photos at 1:70 000 scale. For those areas considered ecologically significant but not covered by 1981 land-use mapping (e.g. White Lake, Kilpoola upland, Mount Kobau), 1988 air photos were interpreted for the land-use category "no perceived activity".

After the air photo interpretation was completed, field checking was conducted to confirm the interpretation and verify boundaries. Limited field checking was conducted in August and November 1989. Extensive field checking during January-March 1990 resulted in further refinement of those polygon boundaries. Because the 1988 air photo interpretation was field checked in 1990, the data are considered to be current as of March 1990.

On the basis of field checking, the boundaries of land-use units considered to be relatively undisturbed were finalized. The appropriate 1:50 000 scale stable base computer-produced 1981 land-use map was overlain with mylar and those "no perceived activity" polygons

that remained unchanged in the intervening period were delineated. For those areas not included in the previous land-use mapping, any areas of "no perceived activity" were transferred from the interpreted air photos to the appropriate mylar registered to 1:50 000 scale base maps of the NTS.

The area of these polygons was then calculated with GENERIC CADD using a digitizing tablet.

Data Accuracy and Limitations

The baseline information for most of this study is 1981 land use. Consequently, the accuracy of tabular and mapped data on relatively undisturbed areas largely depends on the reliability of the 1981 land use. The air photo interpretation and field checking for the 1981 land use was done by a contractor with extensive first-hand knowledge and experience in the Okanagan-Similkameen region. The 1981 land use data are therefore considered to be very reliable.

The scale of mapping (1:50 000) limits the minimum size of a mappable land-use unit to about 2.6 hectares (6.4 acres). The mapping scale also means that map units and their boundaries are, of necessity, generalized. Thus, the data may not be adequate for site-specific evaluations.

The 1988 air photos used were about 1:70 000 scale which limits the amount of detail that can be mapped. This is not considered a major limitation because the project was, for the most part, an update of 1981 land-use mapping.

This study is based solely on land-use information. Only the land activity category "no perceived activity" was selected from the 1981 land-use mapping to identify relatively undisturbed areas.

Much of the land in the study area is grazed by domestic livestock, primarily cattle. If there was evidence of cattle grazing, either through air photo interpretation or field checking, or knowledge of grazing from a secondary source, these areas were considered to be "disturbed" as opposed to "undisturbed".

Some areas identified as being undisturbed may, in fact, be grazed by domestic livestock. If there was no evidence nor knowledge of this, these areas were considered to be relatively undisturbed.

Areas already set aside for conservation purposes (e.g. parks, ecological reserves, wildlife areas) were excluded from areas identified as relatively undisturbed.

Results

The following summarizes the four cover types used in the land-use classification, and examples of typical landscape units in the study area where these cover types are found.

COVER	EXAMPLES OF TYPICAL LANDSCAPE UNITS
non-woody plants	lower elevations
trees	stream banks, higher elevations and slopes
shrubs and bushes	lower elevations
bare surfaces	silt bluffs, bedrock outcrops and cliffs, rock bluffs, areas of natural erosion

Each land-use unit generally contains a range of cover types. The cover types noted in this study represent the dominant cover for the particular unit mapped. Because of the general nature of the cover types, they are useful for overall land-use analysis but are limited for site-specific evaluations.

Table 1 summarizes, by NTS map sheet, the cover type for areas mapped as relatively undisturbed.

The study region encompasses a land area of slightly more than 69 000 ha. An area of 6386 ha (9% of the total study area) was mapped as relatively undisturbed. About 63% had a tree cover. Bare surfaces accounted for 17% of the relatively undisturbed area. This is primarily made up of silt bluffs, bedrock outcrops, cliffs, and rock bluffs. Areas affected by natural erosion also tend to be unvegetated.

Relatively undisturbed areas covered by non-woody plants comprised 13% of the total undisturbed land. Shrubs and bushes covered 7% of the relatively undisturbed area.

Conclusions

Results from this study indicate that over 90% of the land in the south Okanagan and lower Similkameen valleys has been altered from its normal state. Much of the area is grazed by domestic livestock, primarily cattle. In some cases it is difficult to determine whether or not grazing is occurring. The status of grazing tenure on apparently ungrazed land is unknown. Information on the status of grazing tenure would be an asset to help further refine areas that are relatively undisturbed.

TABLE 1. SUMMARY OF COVER TYPES OF RELATIVELY UNDISTURBED AREAS

	Cover type									
	Non-woody plants V4		Trees W1		Shrubs and bushes W2		Bare surfaces X0		Total undisturbed land	
	ha	%	ha	%	ha	%	ha	%	ha	%
Map sheet										
82E/3 (Osoyoos)	184	30	88	14	39	7	303	49	614	10
82E/4 (Keremeos)	409	10	3 115	77	129	3	389	10	4 042	63
82E/5 (Penticton)	136	13	597	55	294	27	52	5	1 079	17
82E/12 (Summerland)	103	16	199	31	9	1	340	52	651	10
Total	832	13	3 999	63	471	7	1 084	17	6 386	100%

The total land area of the study area was calculated to be 69 361 ha.

Areas were calculated with GENERIC CADD using a digitizing tablet.

This study provides an overview of relatively undisturbed areas using land-use analysis. It provides a focus on areas of potential interest for protection of threatened wildlife (flora and fauna) habitat, areas which could then be the subject of more detailed study prior to protection. More detailed mapping (e.g. 1:20 000 scale) and analysis of site characteristics, especially soils and vegetation, would provide the detail needed for areas of specific interest.

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